# 1750 METERS: WESTERN UPDATE #45

THE WESTERN NEWSLETTER FOR THE EXPERIMENTER'S BAND (160 TO 190 KHZ)

**MAY 26, 1987**

***Available for business-size 22 cent SASE's from: Jim Ericson***
***226 Charles St., Sunnyvale, CA 94086***
(Donation for copy cost appreciated)

MORE SASES ON FILE

**ACTIVE WESTERN LOWFER BEACONS (LIST COMPILED 26 MAY, 1987)**

| freq(kHz) | IDENT | QTH | SKED INFO |
|---|---|---|---|
| 160.025 | MAX | Wheatland, WY | 24h/7d CW, BPSK/ASCII by request |
| 163.93 | MSG | Paso Robles, CA | intermittent |
| ✓166.66 | HDO | Morro Bay, CA | 24h/7d BPSK/ASCII by request |
| 169.863 | 1SUN | Durant, OK | 24h/7d when weather permits |
| ✓174.42 | SUK | ElDorado Hills, CA | 24h/7d big signal! |
| 174.85 | 7FS | Montesano, WA | unknown |
| 175.703 | FAW | Orem, UT | 24h/7d |
| 176.25 | C O | Glenwood Springs, CO | 24h/7d |
| 176.3 | BA | Lancaster, IL | 24h/7d |
| 177.26 | NVA | Pahrump, NV | 24h/7d off for the summer |
| ✓177.506 | UCP | Saratoga, CA | daily, approx. 1400 to 1700 GMT |
| 177.750 | CT | Flagstaff, AZ | 24h/7d soon BPSK/ASCII |
| 178.98 | MPM | Salt Lake City, UT | unknown |
| ✓180.6 | NX | Morro Bay, CA | 24h/7d |
| 181.168 | IZJ | San Gabriel, CA | daily, silent 0700 to 1100 GMT |
| ✓181.72 | TLX | Ham AFB, CA | 24h/7d |
| ✓182.37 | G | Palo Alto, CA | 24h/7d |
| 182.62 | FPV | Granada Hills, CA | 24h/7d |
| ✓✓182.9 | Z2 | 9 mi NW San Simeon, CA | 24h/7d note QSY |
| ✓183.16 | PRK | Saratoga, CA | 24h/7d |
| 183.65 | PLI | Toluca Lake, CA | 24h/7d |
| 184.016 | EK | Sunnyvale, CA | 24h/7d |
| ✓184.5 | JKS | San Anselmo, CA | 24h/7d BPSK/ASCII by request |
| 184.588 | Q | Erie, CO | 24h/7d |
| ✓184.795 | MEL | San Jose, CA | 24h/7d |
| 185.49 | AZ | Tucson, AZ | 24h/7d |
| 187.3 | UPN | Cincinatti, OH | 6pm to 6am local |
| 187.49 | J | Los Angeles CA | unknown |
| ✓187.594 | SM | San Jose, CA | 24h/7d |
| 188.47 | 9HDQ | Daleville, IN | 24h/7d |
| 189.720 | 8LXJ | Morrow, OH | 24h/7d |
| 189.8a | NTS | Mercury, NV | 24h/7d on soon with xtal control |

(Check means sig logged at EK QTH in April/May. Double check is QSO with EK. "a" means approximate frequency. Non-western listings are beacons currently being copied in the west, or they have SASE's on file)

**EK NOTES**: Hi again! It's been two months since the last issue, so this one will be 12 pages in order to catch up a bit. During the summer season we won't worry too much about publishing an issue exactly every four weeks. There's not much DX to report, and most folks are busy with new antennas, receiver building, testing, etc etc. You'll note that this issue contains several technical items sent in by readers. We solicit more of this sort of stuff. If you type it, I can just copy directly, and this saves me quite a bit of work.

Activity here has been pretty much limited to organizing the recent LOWFER convention (more on that later), and getting WU#45 in the mail. In spite of increased QRN levels, we are still having good daytime groundwave copy on Z2 (120 miles), and occasionally HDO and NX (160 miles). Summertime dawn propagation will soon start to pick up. Watch for Mike Mideke's PROPAGATION column in the LOWDOWN (probably the July issue) in which he deals with this interesting DX phenomenon.

# WESTERN UPDATE 'KITTY' DRY

**by: Jim Ericson**

As promised, here's a look at the financial/membership history of Western Update for the past year (I took over publication of WU beginning with issue #33)

| Issue | Donations | Copy Costs | Other Costs | Active SASE Members |
|---|---|---|---|---|
| WU#33 | 0 | $23 | $5 | 69 |
| WU#34 | 0 | $34 | $5 | 65 |
| WU#35 | $12 | $28 | $5 | 69 |
| WU#36 | $41.50 | $26 | $5 | 70 |
| WU#37 | $74 | $24 | $5 | 71 |
| WU#38 | $104.88 | $28 | $5 | 72 |
| WU#39 | $58 | $29 | $5 | 77 |
| WU#40 | $61.22 | $28 | $5 | 79 |
| WU#41 | $87 | $29.50 | $5 | 73 |
| WU#42 | $94 | $40 | $5 | 78 |
| WU#43 | $39 | $67.73 | $5 | 91 |
| WU#44 | $51 | $37.23 | $5 | 94 |
| Total | $643.60 | $394.46 | $70 | |

We had additional income of $315 which was individual $15 checks from those who attended the recent convention. Therefore, total income is $643.60 plus $315 equals $958.60.

On the expense side, convention costs (food, rent, etc) totaled $364. Copy costs were $394.46. Courtesy copies, extra stamps, and incidentals of publication ran $70. Paper and chemicals for the 22 8x10 group convention photos (sent to attendees only) ran $35. Thus, total expenses are $863.46.

Bottom line -- Income minus expenses leaves us with $95.14 in the kitty. This will cover costs of WU#45, plus one more smallish issue.

As of this writing we have 106 active SASE members (compared to 69 one year ago). This means copy costs are climbing, while donations are tapering off. A single issue costs about 50 cents, so this means that donations have to average at least $6 per member per year in order for the Update to survive.

Donations have been very broadbased to-date, but quite imbalanced. One member has donated $70 over the past year! Others, under $5. Please consider whether the WU is worth paying for, and if you feel that it is, help us pump some life into the kitty. Thanks!

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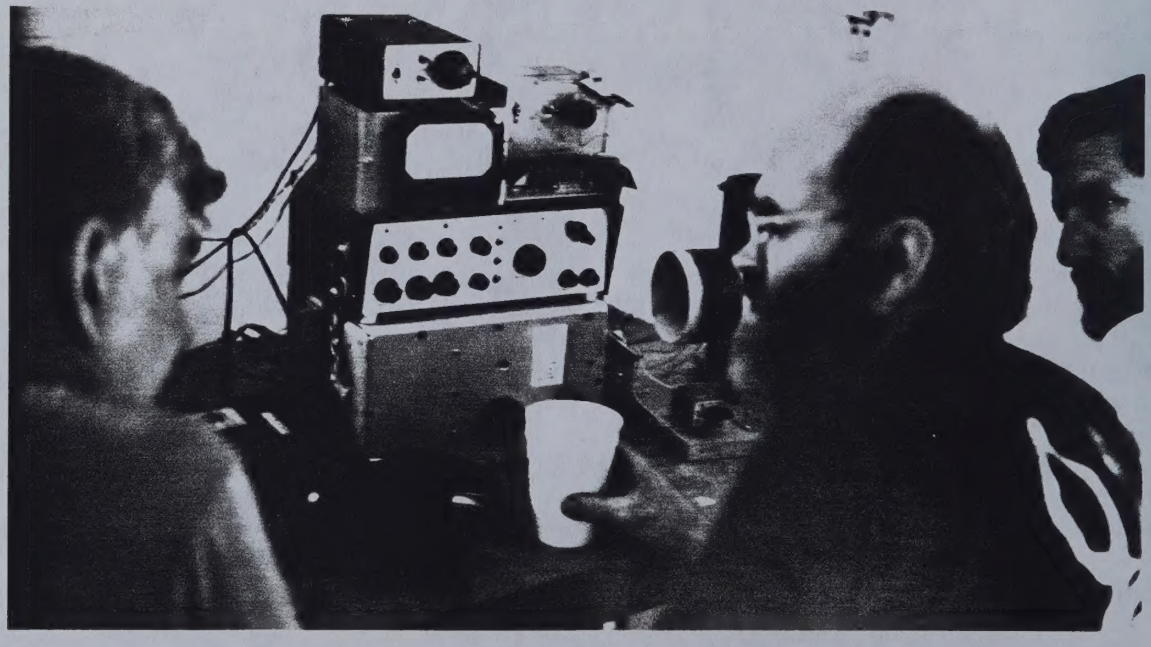
Thanks to Steve McGreevy (TLX) for this convention photo. Mike Mideke demonstrates his new homebrew LF RCVR to Jim Weiss (left) and Ron Jones (MPM) (right).



**Z2 NEWS: By Mike Mideke, PO Box 123, San Simeon, CA. 93452.** On April 18 I fired up the "Big D" (9.215 kHz) running 40W to a pair of grounds a mile apart and over 1000 feet above the shack. Driving away from the site with my newest receiver and a fairly good ferrite loop, I found overwhelming signals at 1 mile, strong (comparable to Hawaii Omega) at 2 miles, readable signals at 3 miles, readable to weak signals at 4 miles and complete loss of signal between 5.5 and 6 miles. This was an improvement of roughly 3 to 5 dB over the previous test, a year ago, when I was only feeding half of the antenna system. But, no great DX!

On the very rare mornings when atmospheric noise is negligible below 10 kHz, the signal probably would make 6 miles or a little more. Higher power and/or coherent techniques would extend the range, but in the absence of a practical application, I doubt that I will devote much effort to these options. Since this is strictly inductive near-field stuff at present, it may be that still lower frequencies would be more effective. I wonder how antenna size versus wavelength versus coverage radius work out at different frequencies?

After a couple months of hearing long periods of nearly continuous GWEN activity rolling in from a distance, the whole thing is coming home in a big way with the appearance of California GWEN signals in early May. (For info on what GWEN is about, refer to "Interim Report on GWEN, EBS and the 1750 meter Band" by Pinto in THE LOWDOWN, Febuary 84. Also, "FEMA-GWEN Update", in THE LOWDOWN, January 85). On May 2nd, Z2 QSYd to 182.9 kHz, having found that my Z2 signal (from about 3/4 mile from the shack) was sometimes rendered uncopyable in my own receiver, despite an insulated wire running all the way from the shack to the xmtr! Observers from central to southern California have reported 10 - 15 kHz of complete receiver blocking, possibly due to the incidental phase noise radiated from on or more very high power transmitters. It is to be hoped that we are presently experiencing a testing phase, and that some of the garbage will be cleaned up in the process. According to statements released early on in the development of GWEN, once a station is in satisfactory operation, its test transmissions should be brief and irregular...though with hundreds of stations involved, this may still mean that elements of the system will be audible at all times. We will have to wait and see. At present, GWEN occupies frequencies spaced every 1 kHz between 150 and 175 kHz. So, for the time being, anyone with a decent receiver should be in good shape anywhere above about 179 kHz. Lurking in the background is a plan to establish a network of 9 FEMA (Federal Emergency Management Administration) stations between 175 and 190 kHz. As proposed, these are even more potent than GWEN, utilizing more power and larger antennas. It remains to be seen whether any of these stations will appear in the forseeable future. WGU20 on 179 kHz was the prototype station, and it has seemingly died on the vine.

For at least awhile we are going to have to deal with very high QRN levels and a certain amount of crowding as LOWFER beacons cluster around the remaining usable frequencies. Those who remain in the GWEN band will have to find operating modes compatible with the monster signals.

Several thoughts come to mind. LOWFERS who have no communications objectives (i.e., just to maintain a CW beacon) might consider getting together with a few others and going to sequenced operation on one frequency. This spectrum conservation move would be an interesting technical task, and it would be a positive benefit to distant listeners who could use the stronger sigs and sequence pattern to really zero in on weaker signals in a sequence. Handy for propagation study as well!

DX and "propagation" - oriented beacons might also consider simplifying their formats so CW ID, dashes, messages, etc are absolutely not necessary...the only essential information is exact frequency and format. A train of pulses (dots or dashes) of known duration and repetition rate will not only be "positive ID", it can be automatically recognized by the receiver, allowing some weak-signal work to continue even when the listener is away or asleep. Such formats should be reasonably well suited to operation in the GWEN band since they can make effective use of the inevitable breaks between GWEN transmission elements. Of course, the basic concept can be readily adapted to FSK or PSK.

73 - mike

2nd ANNUAL LOWFER CONVENTION
MAY 1987

(From left to right): Chip Owens (Q), Carl Lundgren (TH), Mitchell Lee (MEL), Mike Mideke (Z2), John Seamons (JKS), Cliff Buttschardt (HDO), Max Carter (MAX), Boyd Skillin, Dave Stinson (NTS), Jim Weiss, Steve Ratzlaff, Dave Johnson, Herb Vanderbeek (G), Ron Jones (MPM), Greg Farcas (AZ), Eb Keller, Steve McGreevy (TLX), Mark Mallory (MPM), Jim Ericson (EK). Note that Dave and Mark were asleep, but we stood them up anyway for the group picture!

Photo by Jim Ericson

**Communities and their elected representatives, acting in the highest tradition of patriotism, are questioning GWEN and the nuclear war fighting policy it represents.**

**Opposition to GWEN has been voiced by:**

- Town Meeting votes in Amherst and Barre, Massachusetts and Castine, Maine, leading the Air Force to search for sites elsewhere.

  *"BE IT RESOLVED that the Amherst Representative Town Meeting protests the construction of the Ground Wave Emergency Network, in Amherst or anywhere, and requests our representatives in Congress to initiate a thorough review of this network with the aim of cutting off funding for this and other programs which further the notion that we can fight and prevail in a nuclear war . . ."*

- Legal suits by County Commissioners in Lane and Klamath Counties in Oregon.
- Citizen groups insisting on public hearings in Pennsylvania, Wisconsin, North Carolina, New York and California.
- National leaders working to end the arms race:

  □ **Senator Mark Hatfield (R-Oregon)**
  *"The construction of the GWEN system contributes to the mentality that a nuclear holocaust is survivable and therefore winnable. We should be funneling our national resources toward endeavors that minimize the possibility of nuclear war rather than attempting to plan contingencies for surviving one."*

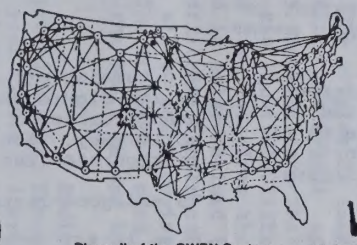
  □ **Rear Admiral Eugene Carroll (USN Ret), for The Center for Defense Information, Washington, D.C.**
  *"I can conceive of no plausible outcome of a U.S./Soviet nuclear exchange in which either government could rationally describe itself as the 'winner' or as having 'prevailed'. GWEN is a dangerous waste of time and money and should not be funded by Congress."*

  □ **Admiral Noel Gayler (USN Ret), former Commander in Chief, U.S. Pacific Forces and former Director of the National Security Agency.**
  *"The idea of controllable or even definable protracted nuclear war is absurd . . . . I assure you, the Emperor has no clothes!"*

## GWEN towers stand for nuclear war

The Pentagon wants to spend a billion dollars for military leaders to communcate after the rest of us have been reduced to ashes!

To find out more how you can be part of effective opposition to GWEN contact:
The GWEN Project
P.O. Box 135
Amherst, MA 01004
(413) 549-1576
or your local No-GWEN Alliance

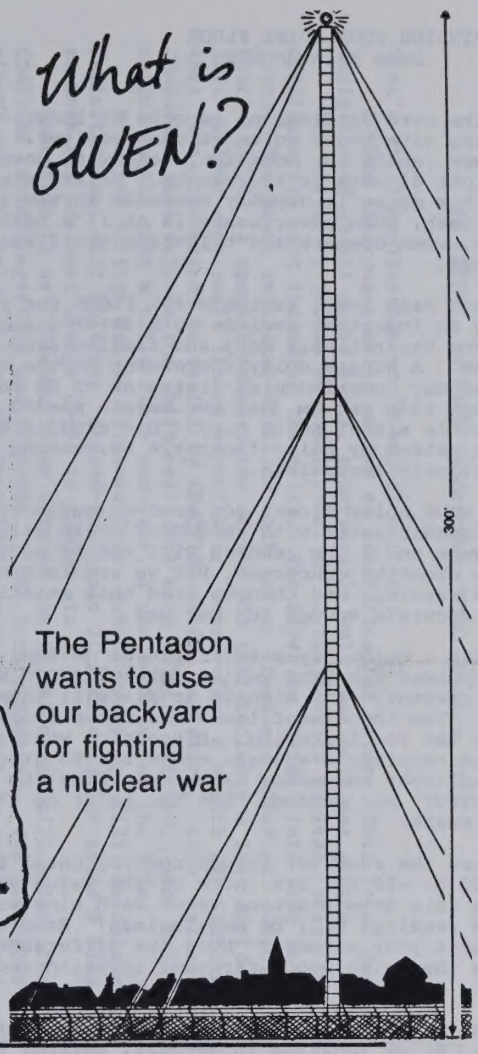


Phase II of the GWEN System.

Ed. note: published in the W.U. for info only. Personally, my only objection to GWEN is the fact that it limits LOWFER activity. tnx ☺

-2-

The GWEN Project, Amherst, Massachusetts, Feb., 1987

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CONVERTERS
R. W. Burhans

I understand there was some discussion of VLF-LF converters at the LOWFER convention. From my disadvantage point here there has not been too much demand for converters compared to antenna preamplifiers, that is, they have not sold well and they have been relatively expensive to produce. However they do work and the recent review by Mitchell Lee (LOWDOWN May 1987) has resulted in somewhat more interest. My VLF-84,86 model was discontinued a few months ago. But now we have a new model in the works which is more complex but without the frills of built-in connectors, and an oscillator which is easier to tune. The technique involves full wave analog switching with a balanced square wave LO and a balanced output transformer in place of the Mini-Circuits Labs SBL-1 diode ring mixer assembly. This uses standard high speed 74HC4066 and 74HCU04 CMOS ICs with a 4.000 MHz crystal oscillator, although we also have a few 3.5 MHz crystals for those who have hamband-only receivers tuning the 80 meter band.

I am in the process of trying to come up with a circuit board layout and anticipate something available by mid-summer this year selling in the $30 price range as a kit or about $40 assembled. Breadboard models have performance equal or better than the SBL-1 with the same low impedance input and output restrictions, but with greater dynamic range and possibly less oscillator feedthru depending on the individual adjustments of the LO phase and amplitude balance and IF tuning. Some trim of these adjustments are possible in the new converter design whereas the SBL-1 depends on the accuracy of the diode matching and centertaped toroids which are sealed inside the SBL-1 can. The design also has a built-in antenna coupler which can be used with external active antennas if needed and a 5 volt regulator for the LO power. The board anticipated will have the same physical size as the previous VLF-86 with input-output pad connections near the same relative sides of the board. So if all goes well we hope to have this available soon. One of the problems here is going through several iterations of circuit board layouts to minimize the balance problems for the user.

**BURHANS ELECTRONICS**
161 Grosvenor St.
Athens, OH 45701

JIM: MITCHELL LEE suggested I send you this in view of the comments regarding availability of my converters at your convention.

Regt Burhans
May 12, 1987

FINDING YOUR NOISE FLOOR
Dave Stinson NTS

One of the more challenging aspects of longwave listening is dealing with local noise at the receiver. All of us, no matter how remote our location, deal with power line hash, pesky light dimmers or floresents. Unlike atmospher ics (QRN), this noise is usually constant in two levels. Daytime hash, when power usage is at it's peak, and nightime, when dimmers and televison oscillators do the dirty work.

This fixed hash level is the NOISE FLOOR for your location. This is an important tool in both determining the weakest signal you can reliably copy and finding crud generators in your area. A single noisy florescent at the other end of the house may contribute as little as +3 DB to your noise floor, but this can be just the margin needed to make a questionable signal solid copy. One cruddie florescent in my shack raises my noise floor +24 DB, making copy of even strong signals impossible.

To find your noise floor, you need an audio transformer and an analog multimeter with an OUTPUT scale calibrated in DB. See figure one. The reading will not be accurate as far as a lab might be concerned, but we are looking for a relative reading, and changes from this starting figure will be accurate enough for our use.

Start with a quiet day with little or no QRN. Find a frequency near the band you're interested in with no signals present. Any signals at all will invalidate your reading. Use the same filters and selectivity settings you normally use for listening. Disconnect your antenna and short the receiver's antenna connector to ground. Connect the transformer and meter as shown. Plug the meter leads into "OUTPUT" and common. Set the meter on it's lowest AC voltage scale.

Now adjust the receiver volume control until the meter reads -30 to -20 DB. Take note of the value you use. You must use this same starting value each time or your relative readings will be meaningless! Remove the short and connect your antenna. Note the differance in readings. This is the noise floor for your location and this antenna.

Different antennas and locations will show different figures. At my location in Mercury, Nevada; the change is from -30 to -12 DB, giving a noise floor of 18 DB (yick!). I assume this is a moderate amount, since NTS is considered a quiet location.

Try turning off electrical appliances in your home and see if the figure changes. A 3 DB change is almost unnoticeable to your ears, but may make a marginal signal solid copy. You might be suprised at how noisy a refrigerator can be!

73 and good listening!

Dave AB5S/7 NTS

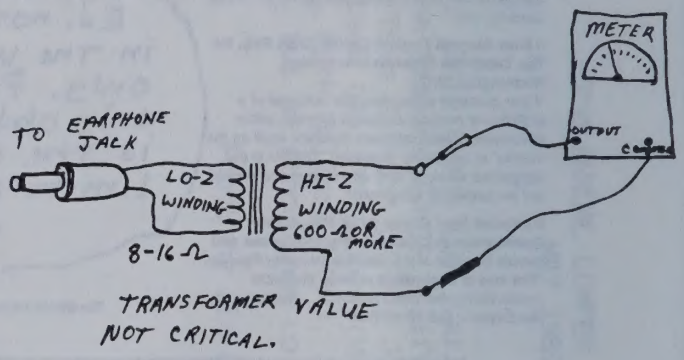


FIGURE ONE.

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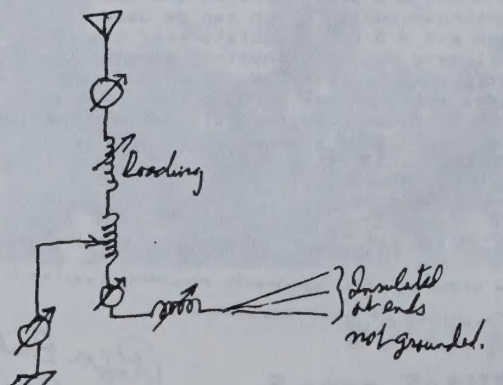
*In going back over the long wave literature since the turn of the century, it is apparent that series antenna tuning was used for both transmit and receive. My most successful tests use paralell tuned circuits in the final tank, with a Faraday shielded link and variometer tuned antenna.*
*The Faraday shield can be constructed by wrapping the tank with about 1-1/4 turn of shim brass or copper. The tank coil should be wrapped with a good grade of cambric or other insulating tape. Insulate the end of the Faraday shield with a vertical strip of double sided tape, such as carpet layer's tape so as to prevent the shim from being a shorted turn. Ground the shim brass. On solenoids, the pickup link can be tapped to vary the coupling, or mount it on a suitable form and slide it up and down the coil. With toroids, a tapped secondary will have to do.*
*I seem to get the best results with a tuned counterpoise. The null point of the link is grounded. This should be near or at the center of the pickup link.*
*To tune, resonate the antenna against the null point ground. Then resonate the counterpoise against the null point, with the antenna and loading device disconnected. Tune for maximum current in the antenna and minimum current in the lead from the null point to ground. The counterpoise should be several wires, and if possible all wires should be the same length and approx 6 to 8 feet off the ground. 7Fs uses 4 wires 150 feet long arranged in a fan over an arc of 45 degrees. I intend to build 3 of these counterpoise assemblies, and use them separately or together to see if it will show any directivity.*
*It is very difficult to match the ground end of a short antenna to the hot end of a paralell tuned tank circuit, unless the antenna is a half wave.*

73
*Keith Olson 7FS*



ID KEYER: by Herb Vanderbeek, WY6G (beacon "G")

What's this! Another beacon ID keyer? Why not!

LOWFER beacons usually employ an identification keyer. This is a description of an all solid state, programmable unit that will not glitch.

The keyer requires external power of 12 to 18 volts at less than 50 milliamperes, not including the relay. The keyer is divided into five sections. The power regulator-MM7812CP with 1uF at input and 100uF at output, clock- XR2242 a special addaptation of the 555 that includes a 128 divider that allows very small timing capacitors, memory-four 8 switch DIP blocks that are converted to serial by CD4021BE shift registers, auto reload-CD4040BE that reloads the shift registers each 32 bits shifted, and relay output rather than a solid state and-gate. I use sockets for the IC's.

* relay voltage can be obtained from prereg supply; R13: calculate /select to set coil voltage; Expand-duplicate IC-4 circuit for added 8 bits or more and you must change C6-R6 to CD4040 pin 2.

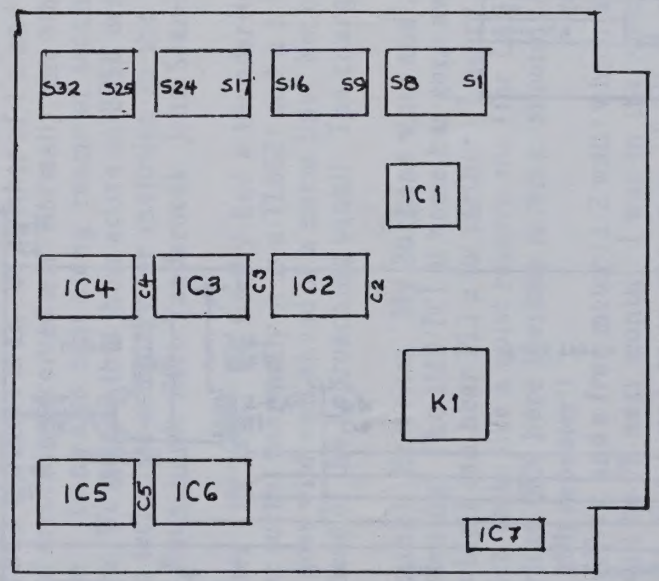
Operation is as follows. Upon turn-on the XR2242 clock will pulse the CD4021BE shift registers and CD4040BE 12 bit binary counter. The CD4040BE after the 32nd pulse pulses the CD4021BEs' parallel/serial control to load the data, "the program" from the parallel switch memory to be output in serial form, "the program". The program is taken off of the last stage of the last shift register, IC2 to the 2N3904 saturated transistor relay driver. I believe that the only specific care that needs to be taken is that the 220pF capacitors shown at pin 11 of CD4021BEs on the schematic must be mounted next to the chip ground pin. Data from the preceding chip pin 3 (Q8) terminates at the capacitor and is daisy-chained to pin 11.

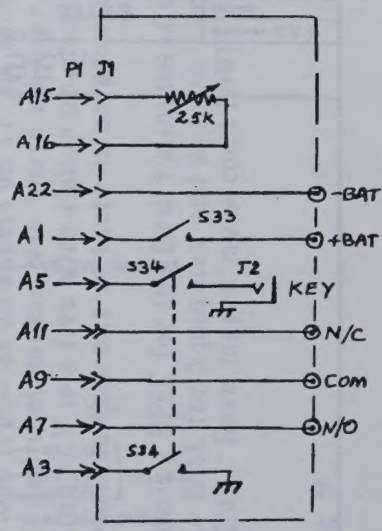
The photograph shows my particular construction. Easy for construction but not cheap. This technique allows quick rewiring, component change, and presents a clean trace side. The PC board I used is available through Radio Shack, Cat #276-190. I removed the board beyond hole location 45.

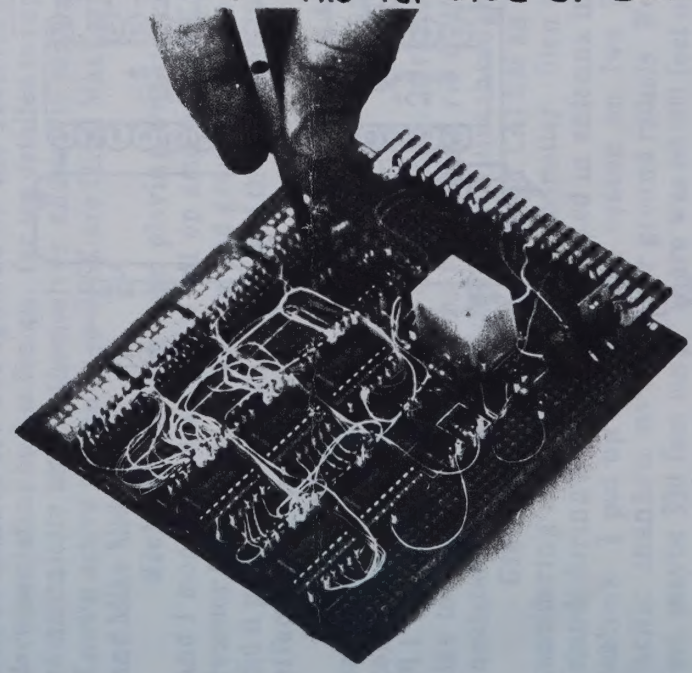
| | |
|---|---|
| Prepunched circuit board | RadioShack #276-190 or equal |
| Wire wrap pin strips 175 pins(5 blocks) | Samtec TSW-136-14-T-S (surplus) |
| 8 pin & 16pin DIP sockets your choice | I use Augat 5xx-AG11D (surplus) |
| 8 switch DIP blocks, your choice | I used R-S 275-1301A |
| IC-1 Clock Oscillator & Div by 128 | EXAR XR2242P |
| IC-2/3/4/5 Shift Registers. | CD4021BE |
| IC-6, Divider/Counter | CD4040BE |
| IC-7 Voltage Regulator | LM317T |
| Q-1 General purpose amp/sat-switch | 2N3904 |
| CR-1/2 general purpose diode | 1N4148 |
| CR-3 rectifier | 1N4001 |
| C-1 Monolithic, stable, CRL 30A104K | 0.1 uF @ 50 Volts |
| C-2/3/4/5,Monolithic, cer, (Mica OK) | 220 pF @ 50 volts |
| C-7 Tantalum, (Lytic OK, add 1uF tant) | 100 uF @ 20 volts |
| C-8 " | 1 uF @ 35 volts |
| C-6/9/10/11 , ceramic,(disk OK) | 0.1 uF @ 50 volts |
| Resistors,1/4W, carbon film, per schem. | I use new surplus |
| Potentiometer, baud rate. | 25k ohms, audio taper. |

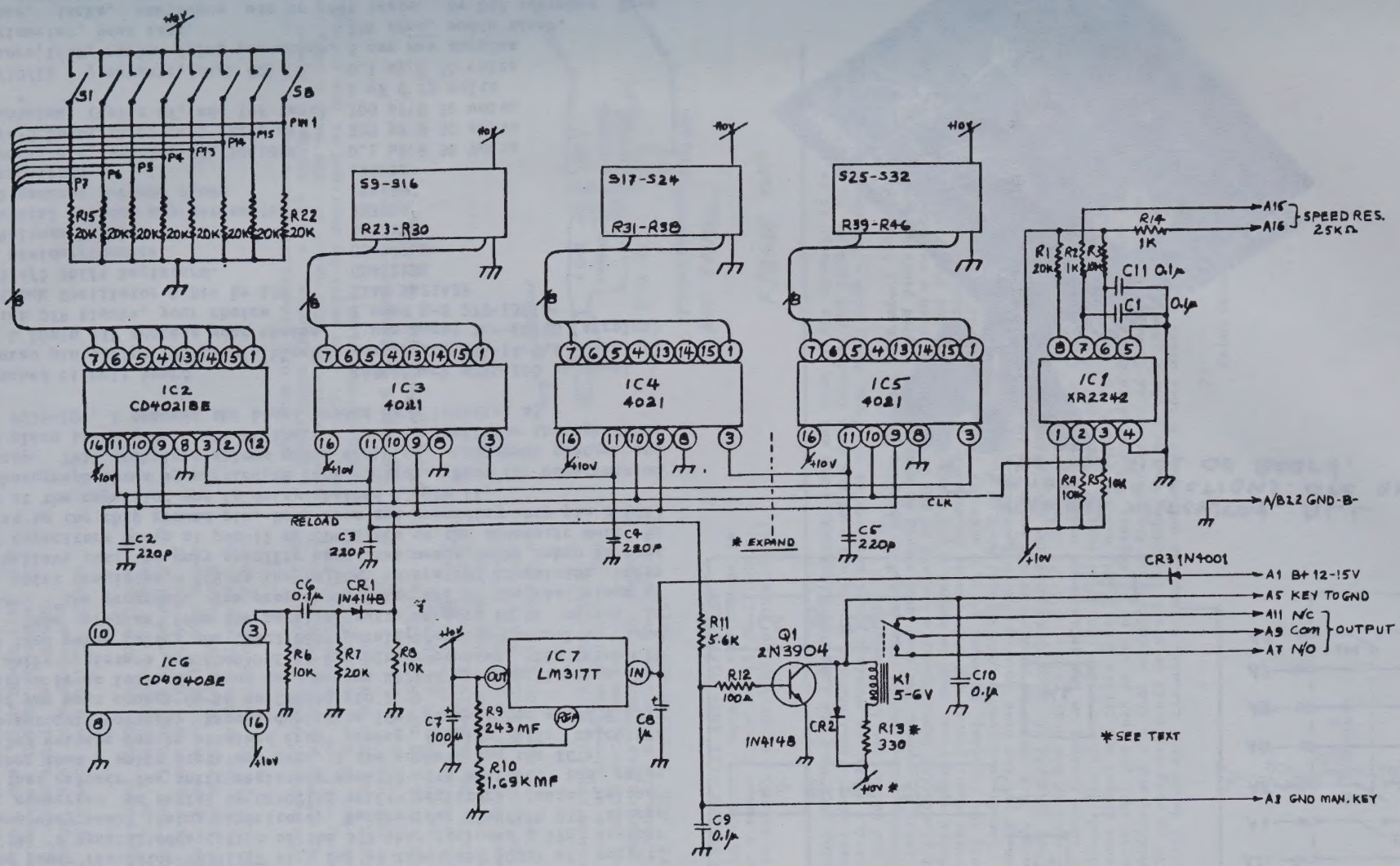
Switches, jacks, enclosure etc to your taste. My DIP switches from RadioShack #275-1301. Relay typically, Hamlin HE421C0500, SIGMA 198TE1C1F-5S, CLARE 922A05C1C, GORDOS 831C-1. SASE for more information/discussion

Herb Vanderbeek, WY6G, 630 Ashton Ave., Palo Alto, Ca., 94306






WU#45, page 8

| | | |
|---|---|---|
| SEA | | |
| SCALE: N/A | APPROVED BY: WY6G | DRAWN BY H.B.V. |
| DATE: 3-20-87 | | REVISED |
| IDENTIFICATION KEYER | | |
| H. VANDERBEEK | | DRAWING NUMBER 171-9839-01 |

**MAILBAG: Mitchell Lee (MEL)** sent the following items: "An article on 76.5 Hz ELF submarine signalling has been published in the April, 1987 issue of Popular Science magazine. ...Ralph Burhans will be issuing a new version of his famous converter sometime this summer. It is an excellent performer. ...The LOWFER convention was great! Let's do it again next year. ...**Ed Gelinas** (WA6AJY) continues to operate 24h/ 7d on 540 kHz with his own backyard broadcast station in the SF bay area. He is replacing the 9 foot tall helix with a base-loaded wire to check the difference in far-field signal strength. It looks like the base loaded wire is better than the helix. ...**PRK Saratoga** CA will have his son's LF broadcast station on 165 kHz soon. When he is not broadcasting AM music, PRK the younger will run a simple CW ident (don't know what). Should be on the air in another month or two. Antenna is up now."

**Dave Johnson** who attended the recent LOWFER convention writes, "Thank you for organizing and hosting such a wonderful event. I learned a lot and met some fine people." Dave works for Fisher Research Laboratory, and sent along some interesting technical notes. Contact him for availability/price on copies of the following. "Experimenting with basement-band Communications". "Basement Band Math and Ferrite Rod Equations". "Low Frequency Loop Antennas Analyzed as Transformers". Dave also notes that Fisher RL is a manufacturer of metal detectors. Some of their spare parts are available for purchase, and include ferrite rods, crystals, etc. Dave's address is listed in this issue. Ferrite rods, cores, etc are also available from Amidon Associates, 12033 Otsego Street, North Hollywood, CA 91607. Mouser, PO 699, Mansfield, TX 76063 is a great experimenter's supply house and they have a nice assortment of transformers and inductors.

**Clint Turner** (CT in Arizona) is working on developing a new transmitter capable of CW, CCW, PSCW, BPSK, and AM. It is also designed to be phase-locked to an external frequency reference. Clint comments, "I'm not claiming that this receiver will be superior to Max's, just more versatile. The ICs will be mostly CMOS and the receiver will draw less than 150 Mz of current. I am proposing several changes in the BPSK protocol that Max has suggested. In standard #1 Max specifies 25 Hz steps. Since most synthesized receivers tune in 10 or 50 Hz increments, I suggest that this standard be changed to 50 Hz intervals. In standard #5, Max specifies that data be transmitted with 1 start bit, 7 data bits, and 2 stop bits. I recommend a slight change to 1 start bit, 8 data bits, and 1 stop bit. Normally, the 8th data bit will be set to 1, but in the case of error correction, the 8th data bit will be a 1 if there is an odd number of 1's, and 0 if there is an even number of 1's. This will aid in correction of errors in received text. Normally, the 8th bit will be masked off and ignored by the receiving program." Clint also sent along reams of technical documentation on his design...far too detailed to reprint here. We suggest that those active in BPSK design communicate among themselves, and try to send a periodic technical summary for inclusion in the WU. Known active currently in BPSK are Clint, Max Carter, Cliff Buttschardt, Herb Vanderbeek, John Seamons, and Mike Mideke.

**Rick Wright** has been playing with an electrometer. He says, "We finally had a thunderstorm and I monitored with a dual 741 op amp in the DC amplifier socket (normally it is a TL082) and a 1 Meg resistor between the longwire and ground. The recording goes wild well ahead of a storm line. Not only did it peg the meter, but it also fried the op amp...30 miles ahead of the approaching squall! The charging effects reach that far out."

**Jim Coote** in LA has a new beacon on the air (see listing). He writes, "My Burhans whip and loop amplifiers arrived yesterday and I have been doing some listening. The IMD/BCI at home has gone away, compared to the old random-wire antenna. With the A-86 whip I can hear PLI a lot farther. I heard IZJ, PLI, and a lot of NDB's from the Rose Bowl parking lot which looks like a quiet receive site (for LA). I'd like to hear any suggestions for getting rid of the powerline QRN here (besides moving, shooting the insulators, and remoting LOWFER activities through my 440 MHz repeater!)."

**Glen Smith** (N6CX of Kenwood, CA) has an RBL-3 receiver, and a freq meter (1/2 watt) which he is considering using for a 1750m transmitter. Glen says, "I will be 78 next month. I was in the Aleutian Islands during WW-2, mostly worked in antenna installations. Got 'typed' as an expert on LF/MF homing beacons. I put up one homing beacon on Iwo Jima in 1949 and that sucker was heard all over the Pacific...thanks to my mania for ground radials. We were running 3KW to a five wire flattop up about 100 feet, maybe 350 feet long. There was 60,000 feet of ground radials in that one as there is no ground on Iwo, the soil is 100% volcanic ash."

Last we heard from **MPM in Salt Lake**, they were running BPSK for the first 5 minutes of each hour, alternating with CW for the next 5 minutes, then back to BPSK for 5 minutes, and so forth. And it works, because **Max Carter** (MAX Wyoming) wrote on April 26th, "Have logged my second LOWFER and

first BPSK/ASCII transmission other than my own! Received MPM from Salt Lake on April 26. I got 32 good "MPM's" (along with lots of isolated P's and M's) around 5:30am, and 65 more around 8:25am. The air distance is about 350 miles and I was hoping for a usable groundwave signal but I'm still very encouraged by this result."

**Vern (AVV)** writes, "Just a note to let you know that AVV is off the air until further notice...maybe permanently. Have tried to get some activity going up here but no luck. Wish Oregon and Wton had activity on LF like you have in California. As it is it gets pretty lonesome here on LF."

**Steve McGreevy** recently got his TLX beacon back in operation...this time, from the Hamilton AFB Amateur Radio Club in Marin County. He presently has a vertical with two tophats, and his signal is being heard throughout northern and central CA.

**GOODIES!** Here's some resource info which may be of interest. **Litz wire** (Litzendraht) is a favorite among LW experimenters for building loading coils. Refer to the April 1987 LOWDOWN article by Mitchell Lee titled **"Litz Wire and 1750 Meter Loading Coils"**. Litz wire can be obtained through **Kerrigan-Lewis Wire Products,** 4421 W. Rice Street, Chicago, IL 60651. (312) 772-7208. They manufacture much of the Litz wire that is used in the US. Write **LF Engineering Company**, 17 Jeffry Road, East Haven, CT 06512 for a copy of their brand new catalog. They have VLF converters, preamps, active antennas, 1750m transmitters, litz wire, crystals, etc etc. **Jim Weiss** of Illinois writes to recommend **H&R Corporation**, 401 E. Erie Avenue, Philadelphia, PA 19134, (215) 425-8870 as an excellent source of surplus goodies and components. Sort of like **Fair Radio Sales**, but more stuff. Fair Radio, by the way, I have found to also be an excellent source of surplus goodies...and their service is great. Write for a catalog to PO 1105, 1016 E. Eureka St., Lima, Ohio 45802 (419) 223-2196. And, if you don't subscribe to the **LOWDOWN** (the monthly journal of the Longwave Club of America) you a missing out. $12 a year to LWCA, 45 Wildflower Road, Levittown, PA 19057.

**EK NOTES: The 2nd annual LOWFER Westcoast convention** was a complete success! We had about 25 attendees, although only 20 attended the overnight campout. We had representation from CA, AZ, UT, WY, IL, and NJ! At the camp area we had four complete LOWFER listening stations setup, plus a 75m ham station which we used to have QSO's with **Sheldon Remington** (Hawaii), **Dale Jarvis** (Utah), and **Clint Turner** (Arizona). The only incident was that **Art Peterson's** brakes failed on the way to the camp area, and he had to be towed to Milpitas for repairs. A multitude of ideas and experiences were shared during the convention. Listening was pretty bad due to local thunderstorm activity, but many CA LOWFERS were copied in spite of the high QRN. The steaks were great, and **Mike Mideke's** homemade beans were the hit at dinnertime! I would like to thank **Mitchell Lee** for the original idea for the convention, and a special thanks to all those who helped out. Any good ideas for next year?

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PUTTING IN A GROUND ROD

Anybody have a suggestion as to an ***EASY*** way to get a 10 foot ground rod into the ground? I usually just wet the ground with a garden hose while pushing and pounding.

Carl K6NU

...I used copper water pipe and sunk it in the easy way, using water pressure to drill the hole.

Bought a 10-foot section of copper tubing... Diameter was just big enough to fit snugly inside the end of my garden hose. Even slipped a hose clamp outside the end of the hose so water wouldn't leak out under pressure.

Turned on the water and pushed the pipe down into the earth. Pushed that sucker down a few inches with a slight twisting motion, then pulled up an inch, then down again, then up again, then down again. Get the picture?

Had such a good time, I sunk another one. Now I gotta network of two 10-foot ground rods, 5 feet apart.

Used a propane torch to solder ground bus to the pipe. Don't trust ground clamps outdoors. Do you?

Bob Parnass, Bell Telephone Laboratories
--

...If you have BIG rocks in your yard nothing will make it ***EASY***. But you CAN do better than a sledge hammer. They are a real pain because it's far too easy to miss that skinny rod when swinging that big heavy hammer. Go to a farm store... and get what my field day group calls a Whomper...a piece of heavy pipe about 1.5 to 2 feet long with one end closed off and the other open. It may or may not have handles on the sides. They're normally used for driving metal fenceposts. You just invert it, put it over the top of the post, and hammer away. No, don't hit it with the hammer, just raise it and slam it back down again. You never miss because you don't take it all the way off. It slides down the post and guides itself. You could probably get one in a rental place as well... or make your own if you have welding equipment.

-Mitch, K2VD

Thanks to Frank Reid W9MKV

# WESTERN UPDATE 'ACTIVE LIST' as of 26 May, 1987

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Anderson | Brice | BA | W9PNE | P.O. Box 14 | Lancaster | IL | 62855 | | (618)299-2441 |
| 2 | Audryejewski | Stat | | W6UCM | 2521 W. LaPalma Unit K | Anaheim | CA | 92801 | | |
| 3 | Babcock | David | | WA6EBH | 2940 Cheyenne Rd. | Riverside | CA | 92506 | | (714)682-1910 |
| 4 | Bahr | Leland | LEE | W0VT | 914 Golden Bear Ln. | Kingwood | TX | 77339-2914 | | (713)359-5284 |
| 5 | Bain | Sam | | W6EGZ | 4106 Nevis St. | Pleasanton | CA | 94506 | | |
| 6 | Balfour | Herbert | OHH | VE3OHH | 91 Elgin Mills Rd. W. | Richmond Hill | Ont. | L4C4M1 | Canada | (416)884-5355 |
| 7 | Barlow | Ron | | N4GJV | Rt. 1 Box 297 | Cleveland | NC | 27013 | | |
| 8 | Bauer | Frank | | W6FPO | P.O.Box 1086 | Felton | CA | 95018 | | (416)884-5355 |
| 9 | Billeci | Dave | | WA6UHA | 211 Molimo Dr. | San Francisco | CA | 94127 | | |
| 10 | Bittner | Mike | | | 27215 Sunnyridge Rd. | Palos Verdes | CA | 90274 | | |
| 11 | Blankenship | Roy | | W6LRT | 1826 Vervais Ave. | Vallejo | CA | 94591 | | |
| 12 | Borglum | James | | | 5549 Lesa Rd. | La Mesa | CA | 92041 | | (619)464-3250 |
| 13 | Bradley | Dave | | W6CUB | POB 23922 | San Jose | CA | 95153 | | |
| 14 | Brady | Aaron | | | 41458 N. 50th St. W | Quartz Hill | CA | 93536 | | (805)943-1580 |
| 16 | Brault | Charles | | | 45 Hickory Ln. | Portsmouth | NH | 03801 | | (603)436-8637 |
| 17 | Burhans | Ralph | | | 161 Grosvenor St. | Athens | OH | 45701 | | |
| 18 | Buttschardt | Cliff | HDO | W6HDO | 950 Pacific St. | Morro Bay | CA | 93442 | | (805)772-2132 |
| 19 | Carter | Max | MAX | | 46 - 14th St. | Wheatland | WY | 82201 | | (307)322-9439 |
| 21 | Collins | Bob | | W6WBY | P.O.Box 93 | Pahrump | NV | 89041 | | |
| 22 | Coote | James | J | WB6AAM | 808 N. Ave 66 | Los Angeles | CA | 90042 | | |
| 25 | Coune | Felix | | K6PAK | 122 Bob Street | Monrovia | CA | 91016 | | |
| 26 | Curry | David | PLI | WD4PLI | 4415 Cahuenga Bl. | Toluca Lake | CA | 91602 | | (818)760-0213 |
| 27 | Cutter | Robert | CO | KIOG | 701 19th St. | Glenwood Springs | CO | 81601 | | |
| 28 | Defrancesco | Sal | SD | K1RGO | 17 Jeffry Rd. | East Haven | CT | 06512 | | (203)467-3590 |
| 29 | Diebold | John | | W7SCU | 2423 8th Ave. No. #301 | Seattle | WA | 98109 | | (206)283-1035 |
| 30 | Diggins | William | 8LXJ | WA8LXJ | 2699 Shamrock Dr. | Morrow | OH | 45768 | | (513)899-2876 |
| 31 | DuVall | Tom | | W6QJZ | 1024 Devonshire | San Diego | CA | 92107 | | (619)223-1576 |
| 32 | Eatough | Charles | | W6UTN | 610 Palacia Ct. | Turlock | CA | 95380 | | |
| 33 | Elmore | Clair | | | 8300 Appian Way | Sebastopol | CA | 95472 | | |
| 34 | Ericson | Jim | EK | KG6EK | 226 Charles St. | Sunnyvale | CA | 94086 | | (408)773-8947 |
| 35 | Farcas | Greg | AZ | AK7Y | PO 17074 | Tucson | AZ | 85731 | | (602)749-4796 |
| 36 | Faulkner | Charles | FPV | W6FPV | 15844 McKeever | Granada Hills | CA | 91344 | | (818)366-6210 |
| 37 | Flynn | Bill | | | 6032 Birch Place | Newark | CA | 94560-4144 | | |
| 39 | Harbison | Norman | NH | K2NH | Rd.1 Box 416 | Monroeville | NJ | 08343 | | (609)881-2749 |
| 40 | Hilferty | Dick | RB | W5TOS | RFD 1 Box 229J | Roswell | NM | 88201 | | (505)623-4895 |
| 43 | Horton | Bob | MSG | W6MSG | 2 Fresno St. | Paso Robles | CA | 93446 | | (805)238-2250 |
| 45 | Humphrey | Lee | | | Rt. 2 Box 626 | Jasper | TX | 75951 | | |
| 46 | Isbell | Daryl | | | Box 860 | Atoka | OK | 74525 | | |
| 48 | Johnston | David | 9HDQ | K9HDQ | RR1 Box 108C | Daleville | IN | 47334 | | (317)354-2884 |
| 49 | Jones | Ron | MPM | K7RJ | 43 Cherryview Dr. | West Valley City | UT | 84120 | | (801)966-6879 |
| 50 | Kincaid | Nilan | | | 5529 W. 140th St. | Hawthorne | CA | 90250 | | (213)643-5269 |
| 51 | Kleinkramer | Paul | MUK | N6MUK | 625 W. Ormonde Rd. | San Luis Obispo | CA | 93401 | | (805)543-3075 |
| 53 | Kopari | Les | | WY6H | 2515 Gitana Ct. | Morgan Hill | CA | 95037 | | |
| 54 | Kraus | Howard | | | 372 Callodine Ave. | Amherst | NY | 14226 | | |
| 55 | Lacy | Milo | | W7GUF | PO 624 | Talent | OR | 97540 | | |
| 56 | Lamboy | Ben | | KP4CA | Guatemala 810 | San Juan | | 00921 | PUERTO RICO | |
| 59 | Larson | Rolf | | | PO Box 60762 | Sunnyvale | CA | 94088 | | |
| 60 | Layer | Hal | | | 1600 Holloway Av. | San Francisco | CA | 94132 | | |
| 62 | Lee | Mitchell | MEL | KB6FPW | 172 N. 24th St. | San Jose | CA | 95116 | | (408)298-3026 |
| 64 | Lonnquist | Paul | | KI6PL | 3010 Merrick San Way | Carmichael | CA | 95608-3517 | | |
| 65 | Lundgren | Carl | TH | W2AZQ | 60 Woodhollow Rd. | Colts Neck | NJ | 07722 | | (201)842-4780 |
| 66 | Mallory | Mark | MPM | | 5196 Cobblecreek Rd.#7K | Salt Lake City | UT | 84117 | | |
| 67 | Manley | Dean | | KH6B | 2058 Ainaola Dr. | Hilo | HI | 96720-3638 | | (808)959-8257 |
| 68 | Marneris | Mike | | K8ERL | 2679 Brady Ct. | Santa Clara | CA | 95051 | | (408)243-9402 |
| 69 | Martin | Lt. Steve | | WA3SAD | 990 Easy St. | Morgan Hill | CA | 95037 | | (408)683-0679 |
| 70 | Maxwell | James | | W6CF | POB 473 | Redwood Estates | CA | 94044 | | (408)353-2094 |
| 71 | McGreevy | Steve | TLX | N6NKS | 45 Elda Dr. | San Rafael | CA | 94903 | | (415)479-4259 |

## ACTIVE LIST, continued

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 73 | Mideke | Michael | Z2 | WB6EER | Box 123 | San Simeon | CA | 93452 | |
| 74 | Miller | Walt | | AJ6T | 724 Elm St. | San Jose | CA | 95126 | (408)293-8926 |
| 75 | Morgan | Robert | | KA0FTA | 2817 W. St. Anne | Rapid City | SD | 57702 | |
| 77 | Munger Jr. | Eugene | | KE4FO | 3331 Bankhead Ave. | Montgomery | AL | 36106-2449 | (205)263-3430 |
| 78 | Murken | Hal | HRM | NQ2Y | 19 Hobby Lane | Oakland | NJ | 07436 | (201)337-3984 |
| 79 | Nixon | Gary | | WA6HZT | 621 Los Lunas Way | Sacramento | CA | 95833 | |
| 81 | Olson | Keith | 7FS | W7FS | E.15470 Hwy.106 | Belfair | WA | 98528 | (206)249-5549 |
| 82 | Osterud | Jim | | AG7A | 519 Capri Circle | Tooele | Utah | 84074 | |
| 83 | Owens | Chip | Q | NW0O | 1363 Tipperary | Boulder | CO | 80303 | |
| 84 | Parker | Jerry | OWR | WA6OWR | PO Box 2448 | Paso Robles | CA | 93447 | (805)239-3180 |
| 85 | Parker | Scott | | WA7VYJ | Univ.Stn. Box 7455 | Provo | UT | 84602 | |
| 86 | Pepe | Bill | | WA2TDR | Box 1915 | Bloomfield | NJ | 07003 | |
| 87 | Peterson | Art | | | 851 31st. St. | Richmond | CA | 94804 | (415)234-2014 |
| 88 | Phillips | Ed | IZJ | W6IZJ | 408 N. Alabama St. | San Gabriel | CA | 91775 | (818)285-8308 |
| 89 | Phillipson | Bill | | W6PRI | 18954 Pendergast Av. | Cupertino | CA | 95014 | |
| 91 | Pomplun | Don | | K2BIO | 521 Van Buren Pl. | San Ramon | CA | 94583 | |
| 92 | Porter | Steve | | KB6LRL | 41 Catalpha Ave. | Mill Valley | CA | 94941 | |
| 94 | Raney | David | UPN | WB8UPN | 4128 Linden Ave. | Cincinnati | OH | 45236 | (513)791-0740 |
| 96 | Ratzlaff | Steve | | AA7U | 954 Henderson /49 | Sunnyvale | CA | 94086 | (408)248-0343 |
| 97 | Rayburn | Les | XMGR | KA1MGR | 665-E Freewill Rd. NW | Cleveland | TN | 37311 | (615)479-4330 |
| 98 | Reid | Frank | | W9MKV | Box 5283 | Bloomington | IN | 47402 | |
| 99 | Remington | Sheldon | HO | NI6E | 210 Laehala St. | Hilo | HI | 96720 | (808)935-8269 |
| 100 | Roberts | Todd | ABC | WD4NGG | POB 1413 | Hilton Head Is. | SC | 29925 | (803)681-8114 |
| 102 | Sahnow | Vern | AVV | W7AVV | 2315 Greenwood Rd. | Independence | OR | 97351 | |
| 104 | Schworer | Lt. Bill | | WC6P | 39079 Walnut Terrace | Fremont | CA | 94538 | |
| 105 | Seamons | John | JKS | KF6VO | 95 Holstein Rd. | San Anselmo | CA | 94960 | (415)456-6090 |
| 106 | Sethman | Bob | QYV | WA3QYV | 92 Allen Plan | Donora | PA | 15033 | (412)379-6994 |
| 107 | Skillin | Boyd | | | 3876 E. Pico | Fresno | CA | 93726 | |
| 110 | Smith | Glen | | N6CX | 220 Laurel/PO 475 | Kenwood | CA | 95452 | |
| 111 | Smith | Dan | PRK | K6PRK | 13165 McDole St. | Saratoga | CA | 95070 | (408)378-7470 |
| 112 | Snow | John | | N6AMZ | 3708 Judah St. | San Francisco | CA | 94122-1227 | |
| 113 | Spaulding | Fred | | | 883 San Simeon Dr. | Mountain View | CA | 94043 | |
| 115 | Spencer | Chris | FAW | WB7FAW | 722 W 1850 N | Orem | UT | 84057 | (801)225-7852 |
| 117 | Statom | Mike | | | 1604 S. Campbell Av. | Alhambra | CA | 91803 | (818)289-7170 |
| 119 | Stinson | Dave | NTS | AB5S/7 | 1400 E. Reno Av. #72 | Las Vegas | NV | 89119 | (702)736-6021 |
| 120 | Storey | Chris | | KA6WNK | 2743 Albatross Dr. | Costa Mesa | CA | 92626 | |
| 121 | Sullivan | John | | | 2069 Touraine Ln. | Half Moon Bay | CA | 94019 | |
| 122 | Taylor | Al | | | 112 Cook Rd. | Whitethorn | CA | 95489 | |
| 123 | Thompson | Arliss | | W7XU | 7314 SW 28th | Portland | OR | 97219 | |
| 124 | Tierney | David | | | 2315 Williams St. | Bellingham | WA | 98225 | |
| 126 | Turner | Clint | CT | KA7OEI | 1825 Calico Way | Flagstaff | AZ | 86004 | (602)527-0011 |
| 127 | VanHorn | Dave | | | 3040 Redhill | Costa Mesa | CA | 92626 | (714)979-1870 |
| 128 | Vanderbeek | Herb | G | WY6G | 630 Ashton Ave. | Palo Alto | CA | 94306 | (415)493-1726 |
| 129 | Vandermaaten | Jim | SM | WB6QZL | 1276 Tourney Drive | San Jose | CA | 95131 | (408)258-6872 |
| 130 | Waggoner | Larry | | | 1712 Valleyview Ct. | Wichita | KS | 67212-1245 | (316)722-3726 |
| 131 | Waldsmith | Gary | SUK | K4SUK | 3550 Ridgeview Dr. | Eldorado Hills | CA | 95630 | (916)933-3815 |
| 133 | Weiss | Jim | | | c/o WTAQ | LaGrange | ILL | 60525 | (312)579-9104 |
| 136 | Wright | Rick | 1SUN | KA5YWH | Box4181 Stn.A SEOSU | Durant | OK | 74701 | |
| 137 | Zizelman | John | | KA5RPU | 1301 S. Alexander Dr. | Baytown | TX | 77520 | |



**DON"T FORGET** to look through the name and address list. Lots of changes and new members. We are up to 106 actives.

I'll be on vacation the last week of June, so expect the next issue about mid-July. Write and tell us about your plans and projects!

**Special thanks to Max Carter** for loaning his BPSK receiver to the CA LOWFERS. We are presently in the process of evaluating it under "California" conditions. Results of this study should make an interesting and informative article for a future issue. CU and 73, Jim